MSO 202A - Complex Analysis

Schedule with number of lectures in brackets

Topic 1:	Complex numbers, Polar form, De Moivre's formula, Argument function	(2)
Topic 2:	Convergent sequences, Series.	(1)
Topic 3:	Functions, Continuity, Complex Differentiation and Cauchy-Riemann equations, Applications of C-R equations.	(2)
Topic 4:	Analytic functions and Power series. Derivative of a power series.	(1)
Topic 5:	Exponential function, Logarithmic function and trigonometric functions.	(1)
Topic 6:	Contour and Contour integral, Antiderivative.	(1)
Topic 7:	ML inequality, Cauchy's theorem, Integration via Cauchy's Theorem.	(1)
Topic 8:	Cauchy integral formula I and II, Examples : evaluation of contour integrals, Derivatives of analytic functions.	(1)
Topic 9:	Applications: Cauchy's estimate, Liouville's theorem, Fundamental Theorem of Algebra, Morera's theorem (without proof), Taylor's Theorem.	(1)
Topic 10:	Applications: Zeros of Analytic functions, Identity theorem, Uniqueness theorem, Applications, Maximum modulus principle, Laurent series.	(1)
Topic 11:	Computation of Laurent expansion, Types of singularities, Poles, Residue at a pole Cauchy residue theorem.	(1)
Topic 12:	Evaluation of real improper integrals.	(2)
Topic 13:	Linear fractional transformations	(1)

1. **Reference:** The main reference is "Advanced Engineering Mathematics" by E.Kreyszig. Supplementary references are "Complex Analysis" by Stein and Shakarchi; "Functions of one complex variable" by Conway.

2. **Course content** :

   - **On Piazza**: The course material will be available exclusively on the **course page** on Piazza. All the notes, exercises, solutions will be shared only on the course page (not by email/MOOKIT). The notes for a week's lectures will be posted after the discussion hour, on Wednesdays. Notes are meant to be supplementary and cannot replace the lectures.
     The course page on Piazza will be used for addressing difficulties regarding the course and to encourage discussions.
   - Exercise sheet for a week's tutorial will be sent out on the Friday preceding it.
   - **Lecture videos**: The lecture videos will be uploaded on MOOKIT. Videos will be published on Wednesdays, after the discussion hour.
   - **Announcements**(if any) will be made on Piazza only.

3. **Assessment:**

   (a) There will be surprise and announced quizzes held during discussion and tutorial sessions. This will contribute to the continuous evaluation component.

   (b) A final assessment (Quiz/Home assignment) will be conducted during the mid-sem week.

   (c) Access to gradescope and MOOKIT is required for being able to attempt all components of the assessment. In case of *inability to access* the portal in the time frame provided for each quiz/exam, that particular component will be taken as not-attempted.
   Special Note: You should be able to download, annotate and upload PDF files.

   (d) The weightage for the continuous evaluation and final evaluation components will be 75% and 25% respectively.

   (e) Non-attempted announced quizzes will be pro-rated based on the next Quiz in the same category or the Final exam. Surprise quizzes and Final exam WILL NOT be pro-rated. For pro-rating, if two consecutive quizzes are not-attempted then the first one will be awarded 0 marks.

(f) A student who is later approved in the 'Poor internet connectivity' category after more than one attempted Quiz (Announced/Surprise) will not be allowed to drop the course.

(g) **No make-up quiz/exam** will be conducted. Evaluation for those with poor internet connectivity in the list approved by DoAA, will be conducted on a case-by-case basis. They will be communicated directly.

4. **Attendance:** Attendance for tutorial/discussions is mandatory.

5. **Cheating and Malpractice:** If unfair means are brought to notice for any of the evaluation methods used, disciplinary action as recommended by SSAC will be taken.